

Section 8.3: Trigonometric Integrals - Worksheet

1. Calculate the following integrals.

$$\begin{array}{lll} \text{(a)} \int \sin(5x)^2 dx & \text{(c)} \int_0^{\pi/21} \tan(7\theta)^3 d\theta & \text{(e)} \int_{\pi}^{3\pi/2} \cos(z)^5 \sin(z)^8 dz \\ \text{(b)} \int \sec(2x)^4 \tan(2x)^6 dx & \text{(d)} \int \sec(3x)^2 \ln(\sec(3x)) dx & \text{(f)} \int_{\pi/3}^{\pi/2} \sqrt{\frac{1+\cos(t)}{1-\cos(t)}} dt \end{array}$$

2. Express $\int \sin(3x)^n dx$ in terms of $\int \sin(3x)^{n-2} dx$.

3. Consider the region bounded by the x -axis, the graph of $y = \sec(x)^2 \tan(x)$ and the lines $x = 0$, $x = \frac{\pi}{4}$. Calculate the volume of the solid obtained by revolving \mathcal{R} about (a) the x -axis, (b) the y -axis.

4. Evaluate $\int \sec(\theta)^3 d\theta$ and $\int \sec(\theta) \tan(\theta)^2 d\theta$.

5. Calculate the arc length of the curve $y = x + \cos(x) \sin(x) - \frac{1}{8} \tan(x)$, $0 \leq x \leq \frac{\pi}{4}$.